



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[Docket No. PRM-50-105; NRC-2012-0056]

In-core Thermocouples at Different Elevations and Radial Positions in Reactor Core

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; receipt and request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC or the Commission) is publishing for public comment a notice of receipt for a petition for rulemaking (PRM), dated February 28, 2012, which was filed with the NRC by Mr. Mark Edward Leyse (the petitioner). The petition was docketed by the NRC on March 2, 2012, and assigned Docket No. PRM-50-105. The petitioner requests that the NRC amend its regulations to “require all holders of operating licenses for nuclear power plants (“NPP”) to operate NPPs with in-core thermocouples at different elevations and radial positions throughout the reactor core.”

DATES: Submit comments by **[INSERT DATE 75 DAYS FROM DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the NRC is able to assure consideration only for comments received on or before this date. Due to resource constraints the NRC cannot guarantee explicit response to comments received after this date.

ADDRESSES: You may access information and comment submissions related to this petition for rulemaking, which the NRC possesses and are publicly available, by searching on <http://www.regulations.gov> under Docket ID NRC-2012-0056. You may submit comments by the following methods:

- **Federal rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID NRC-2012-0056. Address questions about NRC dockets to Carol Gallagher; telephone: 301-492-3668; e-mail: Carol.Gallagher@nrc.gov.
- **E-mail comments to:** Rulemaking.Comments@nrc.gov. If you do not receive an automatic e-mail reply confirming receipt, then contact us at 301-415-1677.
- **Fax comments to:** Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.
- **Mail comments to:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.
- **Hand deliver comments to:** 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. (Eastern Time) Federal workdays; telephone: 301-415-1677.

For additional direction on accessing information and submitting comments, see “Accessing Information and Submitting Comments” in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Cindy Bladey, Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-492-3667, e-mail: Cindy.Bladey@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Accessing Information and Submitting Comments

A. Accessing Information

Please refer to Docket ID NRC-2012-0056 when contacting the NRC about the availability of information for this petition for rulemaking. You may access information related to this petition for rulemaking, which the NRC possesses and are publicly available, by the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID NRC-2012-0056.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**
You may access publicly available documents online in the NRC Library at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The incoming petition is in ADAMS under accession No. ML12065A215.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID NRC-2012-0056 in the subject line of your comment submission, in order to ensure that the NRC is able to make your comment submission available to the public in this docket.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <http://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment submissions into ADAMS.

II. The Petitioner

The petition states that the petitioner previously submitted an earlier PRM to the NRC on emergency core cooling systems (ADAMS Accession No. ML070871368), which the NRC assigned Docket ID PRM-50-84 (73 FR 71564; November 25, 2008). In addition, the petition states that the petitioner co-authored a paper entitled, "Considering the Thermal Resistance of Crud in LOCA Analysis" (American Nuclear Society, 2009 Winter Meeting, Washington DC (November 15-19, 2009)).

III. The Petition

In its petition (ADAMS Accession No. ML12065A215), the petitioner requests that the NRC amend its regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” to “require all holders of operating licenses for nuclear power plants (“NPP”) to operate NPPs with in-core thermocouples at different elevations and radial positions throughout the reactor core to enable NPP operators to accurately measure a large range of in-core temperatures in NPP steady-state and transient conditions.” The petitioner further asserts that, in the event of a severe accident, in-core thermocouples would provide NPP operators with “crucial information to help operators manage the accident.”

In addition to several other reports and findings cited by the petitioner to support the petition, the petitioner cites the “Report of the President’s Commission on the Accident at Three Mile Island [TMI]: The Need for Change: The Legacy of TMI,” dated October 1979. The petitioner states that “[i]n the last three decades, NRC has not made a regulation requiring that NPPs operate with in-core thermocouples at different elevations and radial positions throughout the reactor core to enable NPP operators to accurately measure a large range of in-core temperatures in NPP steady-state and transient conditions, which would help fulfill the President’s Commission recommendations. If another severe accident were to occur in the United States, NPP operators would not know what the in-core temperatures were during the progression of the accident.” The petitioner continues by stating that “[i]n a severe accident, core-exit thermocouples would be the primary tool that was used to detect inadequate core cooling and core uncover.” The petitioner states “[t]he problem with using a predetermined core-exit temperature measurement to signal the time for NPP operators to transition from EOPs [Emergency Operating Procedures] to implementing SAMGs [Severe Accident

Management Guidelines] is that experimental data indicates that core-exit temperature (“CET”) measurements have significant limitations: 1) ‘[t]he use of the CET measurements has limitations in detecting inadequate core cooling and core uncover;’ 2) ‘[t]he CET indication displays in all cases a significant delay (up to several 100 [seconds]);’ and 3) ‘[t]he CET reading is always significantly lower (up to several 100 [Kelvin]) than the actual maximum cladding temperature.’”¹ The petitioner continues by asserting that “despite the fact that ‘the nuclear industry developed SAMGs during the 1980s and 1990s in response to the [Three Mile Island] accident and followup activities,’ which ‘included extensive research and study (including several [probabilistic risk assessments]) on severe accidents and severe accident phenomena,’² NRC and the nuclear industry have ignored experimental data indicating that CET measurements have significant limitations. And ignored the President’s Commission recommendations that NPPs have ‘instruments that can provide proper warning and diagnostic information; for example, the measurement of the full range of temperatures within the reactor vessel under normal and abnormal conditions.’”³

The petitioner cites the NRC’s July 2011 “Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” by stating that “‘EOPs typically cover accidents to the point of loss of core cooling and initiation of inadequate core cooling (e.g., core exit temperatures in PWRs greater than 649 degrees Celsius (1200 degrees Fahrenheit)).’”⁴ The petitioner continues by stating

¹ Robert Prior, *et al.*, OECD Nuclear Energy Agency, Committee on the Safety of Nuclear Installations, “Core Exit Temperature (CET) Effectiveness in Accident Management of Nuclear Power Reactor,” NEA/CSNI/R(2010)9, November 26 2010, p. 128.

² Charles Miller, *et al.*, NRC, “Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” SECY-11-0093, July 12, 2011, available at: www.nrc.gov, NRC Library, ADAMS Documents, Accession Number: ML 111861807, p. 47.

³ John G. Kemeny, *et al.*, “Report of the President’s Commission on the Accident at Three Mile Island: The Need for Change: The Legacy of TMI,” p. 72.

⁴ Charles Miller, *et al.*, “Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,” p. 47.

“[u]nfortunately, NRC and Westinghouse do not consider that experimental data from tests conducted at four facilities indicates that CET measurements would not be an adequate indicator for when to transition from EOPs to implementing SAMGs in a severe accident.”

The petitioner cites findings of experiments, including a LOFT LP-FP-2 experiment, and states that “[t]he results of LOFT LP-FP-2 and other experiments demonstrate the need for NPPs to operate with in-core thermocouples at different elevations and radial positions throughout the reactor core to enable NPP operators to accurately measure a large range of in-core temperatures in NPP steady-state and transient conditions.”

The petition states that the “[p]etitioner is submitting this 10 C.F.R. § 2.802 petition because if NPPs were to operate with in-core thermocouples at different elevations and radial positions throughout the reactor core to enable NPP operators to accurately measure a large range of in-core temperatures in NPP steady-state and transient conditions, it would help improve public and plant-worker safety. In the event of a severe accident, in-core thermocouples would enable NPP operators to accurately measure in-core temperatures, providing crucial information to help operators manage the accident; for example, indicating the

time to transition from EOPs to implementing SAMGs.” The petitioner also asserts that “[i]f implemented, the regulation proposed in this petition for rulemaking would help improve public and plant-worker safety.”

Dated at Rockville, Maryland, this 16th day of May 2012.

For the Nuclear Regulatory Commission.

/RA/

Annette L. Vietti-Cook,
Secretary of the Commission.

[FR Doc. 2012-12475 Filed 05/22/2012 at 8:45 am; Publication Date: 05/23/2012]